29th International Cosmic Ray Conference Pune (2005) **00**, ???-???

Simulation of the ATIC-2 Silicon Matrix for Protons and Helium GCR Primaries at 0.3, 10, and 25 TeV/nucleon

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The energy deposition distribution for protons and helium galactic cosmic ray primaries at 0.3, 10, and 25 TeV/nucleon in the ATIC-2 silicon matrix detector are simulated with GEANT4.

1. Introduction

The GEANT3 geometrical model of ATIC developed by the University of Maryland was combined with a GEANT4 application developed for the Deep Space Test Bed (DSTB) detector package. The new code included relatively minor modifications to completely describe the ATIC materials and a more detailed model of the Silicon Matrix detector. For this analysis all particles were started as a unidirectional beam at a single point near the center of the Silicon Matrix front surface. The point was selected such that each primary passed through at least two of the overlapping silicon pixels.

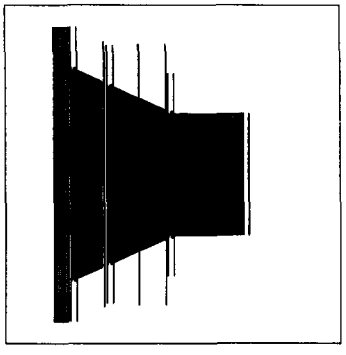

Figure 1. ATIC GEANT4 Geometry model. (The Silicon Matrix is at the left.)

2. Discussion

The starting primaries were mono-energetic with energies 0.3, 10, and 25 TeV/nucleon. 100000 primaries were started for each sample run. Figures 2 through 7 show the distribution of energy deposited in the first